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Woodward-Clyde Consultants

5013

TASK 2 DRAFT REPORT
ADDITIONAL DATA ACQUISITION AND INTERPRETATION: DEL AMO HAZARDOUS WASTE SITE LOS ANGELES, CALIFORNIA

VOLUME 1 OF 2

Prepared for:

Department of Health Services
107 South Broadway
Room 7011
Los Angeles, California 90012

16 April 1987

TASK 2 DRAFT REPORT
ADDITIONAL DATA ACQUISITION AND INTERPRETATION
DEL AMO HAZARDOUS WASTE SITE
LOS ANGELES, CALIFORNIA

EXECUTIVE SUMMARY

The Del Amo Hazardous Waste site, which is the subject of this investigation, is a fenced-in, 200 feet wide by 600 feet long parcel in Los Angeles, California. It is located between Vermont and Normandie Avenues and south of Del Amo Boulevard. This report provides the deliverables under Task 2 of the feasibility study for the site. The investigations undertaken and reported herein were described in a Sampling Work Plan dated 29 August 1985, and subsequently modified as the implementation progressed. Major revisions were the inclusion of soil gas investigation and revisions to the deep (Gage) aquifer well installation program.

The site is part of a former chemical manufacturing facility. Plants at the site manufactured styrene, co-polymer, and butadiene among other compounds. Wastes from these manufacturing operations were disposed in two "bogs" at the site from about 1942 through 1969. The western part of one pit from Bog #1 (Pit 1C) and the six pits of Bog #2 (Pits 2A through 2F) are within the site boundaries investigated. A previous investigation by Dames and Moore (1984) characterized the wastes and soils underlying these pits. They were identified to contain high concentrations of volatile aromatic compounds (benzene, ethylbenzene, toluene and xylene) and variable concentrations of polynuclear aromatics (phenanthrene, naphthalene, anthracene, fluoranthene, pyrene and styrene). Heavy metals were not found in concentrations considered toxic.

This investigation included the sampling and laboratory analyses from 13 on-site locations to evaluate the lateral extent of contaminant migration from the pits. Sampling locations were along seven north-south traverses and samples were generally collected at about 8 foot intervals to a depth of 57-1/2 feet. Samples were analyzed for polynuclear aromatics and volatile aromatics. Also, a soil gas survey was undertaken at 23 locations along 4 traverses. Gas samples were collected at depths of 4, 8, 12 and, in some cases, 16 foot depths and analyzed in the field using a gas chromatograph.

10-Apr-87

Table 3 : Summary of Soil Sample Analyses for On-site Borings

Location / Boring No / Pit	Sample No.	Depth ft	OVA ppm	PNA Analyses, EPA Method 8310 in mg/kg: Oil	Phen	Pyrene	Napht	Fluora	Total	VAH Analyses, EPA Method 8240 in mg/kg: Oil	Bz	EthBz	Tol	MBK	Total
B-1B-1	1	1	10	1.0	U	U	U	U	U						
Pit 1C	2	9	70												
S 21-1/2'	3	17	10												
	4	25	30	1.0	U	U	U	U	U	1.0	U	U	U	U	U
	4DUP	25	30	1.0	U	U	U	U	U						
	5	33	150												
	6	41	1000+	1.0	U	U	U	U	U						
	7	52	1000+												
	8	57	1000+	1.0	U	U	U	U	U	1.0	2.8	U	U	U	2.8
B-2-1	1	1	1												
Pit 2B	2	9	1000+	58.0	150.0	170.0	140.0	810.0	1393.0						
N 15'	3	17	1000+												
	4	25	1000+												
	5	33	1000+	20.0	22.0	24.0	U	120.0	176.9						
B-2B-1	1	1	12	1.0	U	U	U	U	U	1.0	U	U	U	U	U
Pit 2B	2	9	4												
S 18-1/2'	3	17	34	1.0	U	U	U	U	U	1.0	0.3	0.6	U	U	2.5
	4	25	1000+												
	5	33	1000+	18.0	4.5	4.6	U	30.0	39.1	1.0	22.0	91.0	1.2	0.6	119.5
	6	41	1000+												
	7	49	1000+	5.0	15.0	11.0	6.7	98.0	137.5	1.0	32.0	110.0	1.7	2.0	146.7
	8	57	1000+												
B-2B-2	1	1	0												
Pit 2B	2	9	4	1.0	U	U	U	U	U						
S 50'	3	17	6												
	4	25	500	1.0	U	U	U	U	U	1.0	0.5	0.2	U	U	0.7
	5	33	1000+												
	6	41	1000+	1.0	U	U	U	U	U						
	7	49	1000+												
	8	57	NT	1.0	U	U	U	U	U	1.0	U	U	U	U	U
B-3B-1	1	1	1000+												
Pit 2D	2	9	1000+												
N 0'	3	17	1000+							1.0	U	U	U	U	U
	4	25	1000+	26.0	26.0	30.0	U	180.0	245.0						
	5	33	1000+												
	6	41	1000+												
	7	49	NT												
	8	57	1000+	1.0	U	U	U	U	U						

10-Apr-87

Table 3 (Contd): Summary of Soil Sample Analyses for On-site Borings

Location / Boring No / Pit	Sample No.	Depth ft	OVA ppm	PAH Analyses, EPA Method 8310 in mg/kg: Oil	Phen	Pyrene	Naoht	Fluora	Total	VOH Analyses, EPA Method 8240 in mg/kg: Oil	Bz	EthBz	Tol	MBX	Total
B-38-2	1	1	70	1.0	U	0.5	U	1.8	3.4	2.0	5.6	1.3	0.2	U	9.9
Pit 2B	2	9	1000+												
N 15°	3	17	1000+	100.0	20.0	16.0	U	120.0	150.0						
	4	25	1000+												
	5	33	1000+												
	6	41	1000+	50.0	120.0	100.0	110.0	560.0	910.0						
	7	49	1000+												
	8	57	1000+	50.0	85.0	75.0	63.0	533.0	766.0	100.0	1300.0	900.0	35.0	U	2235.0
B-38-3	1	1	1	1.0	0.4	0.4	0.4	0.9	2.6						
Pit 2D	2	9	4												
N 22.5	3	17	1000+	100.0	58.0	51.0	U	370.0	569.0	100.0	3900.0	2200.0	61.0	TR	5261.0
	4	25	1000+												
	5	33	1000+	30.0	47.0	67.0	32.0	310.0	476.7	20.0	1200.0	460.0	15.0	TR	1654.0
	6	41	1000+												
	7	49	NR												
	8	57	1000+	100.0	350.0	82.0	U	359.0	493.0	100.0	2500.0	1400.0	31.0	TR	3931.0
B-38-4	1	1	0												
Pit 2D	2	9	30	1.0	U	U	U	U	U						
N 60°	3	17	300												
	4	25	1000+	50.0	46.0	49.0	50.0	300.0	454.0	100.0	1900.0	1100.0	15.0	E	3015.0
	5	33	1000+												
	6	41	1000+	20.0	43.0	45.0	40.0	290.0	438.0						
	7	49	1000+												
	8	57	1000+	20.0	31.0	26.0	17.0	200.0	294.0	100.0	2700.0	1500.0	20.0	E	4225.0
	BOUP	57	1000+	20.0	37.0	32.0	25.0	230.0	335.0						
B-4-1	1	1	0												
Pit 2E	2	9	0												
N 15°	3	17	0												
	4	25	0												
	5	33	1000+	1.0	U	U	U	U	U						
	6	41	1000+	1.0	U	U	U	U	U						
	6DUP	41	1000+	1.0	U	U	U	U	U						
	7	49	1000+	1.0	U	U	U	U	U						
	8	57	1000+	1.0	U	U	U	U	U						
B-48-1	1	1	NR												
Pit 2F	2	9	1	1.0	42.0	9[illegible]	U	310.0	4[illegible]						
S 21-1/2°	3	17	1000+	1.0	4.2	5.[illegible]	U	U	1[illegible]						

Table 3 (Contd): Summary of Soil Sample Analyses for On-site Borings

Location / Boring No / Pit	Sample No.	Depth ft	OVA ppm	PNA Analyses, EPA Method 8310 in mg/kg						VAH Analyses, EPA Method 8240 in mg/kg					
				Dil	Phen	Pyrene	Napht	Fluora	Total	Dil	Bz	EthBz	Tol	MBK	Total
B-48-2	1	1	2	1.0	0.8	0.2	0.9	2.6	7.3						
Pit 2F	2	9	6												
S 33'	3	17	>1000*	10.0	28.0	16.0	28.0	120.0	199.7	100.0	>1800.0	>1900.0	25.0	TR	>3725.0
	4	25	>1000*												
	5	33	>1000*	10.0	54.0	31.0	64.0	250.0	427.1						
	6	41	>1000*												
	7	49	>1000*												
	8	57	450	1.0	U	U	U	U	U	2.0	0.9	U	U	U	0.9
B-48-3	1	1	0	1.0	U	U	U	1.6	4.7						
Pit 2F	1DUP	1	0	1.0	U	U	U	1.9	7.0						
S 53'	2	9	0												
	3	17	4												
	4	25	500	1.0	U	U	U	U	U	1.0	0.2	0.6	U	U	0.8
	5	33	200												
	6	41	>1000*												
	7	49	>1000*	1.0	U	U	U	U	U	1.0	8.6	0.7	U	U	9.3
	8	57	>1000*	1.0	U	U	U	U	U						
B-58-1	1	1	10	1.0	U	0.2	U	0.9	0.6						
Pit 2E	2	9	>1000*												
S 15'	3	17	>1000*	50.0	11.0	9.0	U	84.0	104.0	100.0	>1500.0	940.0	U	U	>2446.0
	4	25	>1000*												
	5	33	>1000*												
	6	41	>1000*	50.0	14.0	14.0	U	110.0	138.0						
	7	49	>1000*												
	8	57	>1000*	50.0	26.0	36.0	U	190.0	246.0	100.0	>1700.0	730.0	15.0	U	>2445.0

Abbreviations and Notes:

U	Undetected	Phen	Phenanthrene
NR	No Recovery	Pyrene	Pyrene
NT	Not Taken	Napht	Naphthalene
TR	Trace	Fluora	Fluoranthene
OVA	Organic Vapor Analyzer	Bz	Benzene
PNA	Polynuclear Aromatic	EthBz	Ethylbenzene
VAH	Volatile Aromatic Hydrocarbons	Tol	Toluene
ft	feet	MBK	2 - Hexanone
ppm	Parts per Million	Total	Total concentration of all Compounds for the analysis
ft	Feet		
ppm	Parts per Million		

TABLE 4

LOCATION OF SAMPLES ANALYZED FOR BACKGROUND

Sample Location	Depth Below Ground Surface, ft	OVA Reading ppm
Well P1	6	0
Well P1	25	0
Well P3	9	0
Well P3	45	1
Well G1	10	0
Well G1	20.5	0
Well G2	49	0
Well G2	65	0

Notes:

1. All background samples were analyzed in the laboratory for polynuclear aromatic hydrocarbons in accordance with EPA Method 8310. None were detected.

2. Sampling locations are presented in Figure 6.

TABLE 9

DETAILS OF WELL CONSTRUCTION

Well No.	Construction Date	Elevation of Top of Casing (MSL)	Depth to Bottom of Screen (Feet)	Length of Screen (feet)	Slot Size (inch)	Length of Solid Casing	Depth to Top of Filter Pack	Type of Filter Pack	Thickness of Seal
P1	10-20-86	32.83	80	20	0.01	60	55	#20 Sand	6
P2	10-09-86	35.12	75-1/2	20	0.02	55-1/2	51	#3 Lonstar Sand	5
P3	11-14-86	29.33	95	10	0.01	85	80	#30 Sand	10
G1	02-18-86	26.75	90	10	0.01	80	75	#20 Sand	5
G2	02-26-87	34.33	92	10	0.01	82	74-1/2	#20 Sand	4

TABLE 15

SUMMARY OF VOLATILE ORGANICS
ANALYSES ON WATER SAMPLES
(EPA METHOD 624)

Well No. (Sampling Date)	Dilution Factor	Compounds Detected (concentration in ug/l)
P1 (11/4/86)	100	See Note 1. Benzene (700,000); Chlorobenzene (300,000); Ethylbenzene (300,000); Total Xylenes (140,000)
P2 (3/2/87)	1000	Benzene (150,000)
P4 (3/2/87)	1000	Benzene (160,000)
P3 (3/5/87)	1	Acetone (23); Benzene (3); Ethylbenzene (1)
G1 (3/2/87)	1	Chloroform (1)
G3 (3/2/87)	1	Chloroform (1); Benzene (1); MIBK (TR); Toluene (2); Ethylbenzene (1); Total Xylenes (1)
G2 (3/3/87)	1	None Detected
DM1 (3/6/87)	5000	Benzene (1,600,000) [152,500 to 750,000]
DM4 (3/6/87)	1000	Benzene (380,000)
DM2 (3/9/87)	5000	Benzene (240,000) [350]
DM3 (3/9/87)	100	Benzene (5,200) [2600 to 9600]; Toluene (300) [7]
P5 (3/2/87)	1	Methylene Chloride (42); Benzene (2)
P5 (3/5/87)	1	Chloroform (4); Benzene (2); Ethylbenzene (1)
DM5 (3/9/87)	100	None Detected. See Note 5.

What's the final Conc.?

Notes:
1. Sample of floating product from Well P1 was analyzed. An EPA Method 418.1 analysis indicator sample contained 78.9 percent petroleum hydrocarbons.
2. TR-Trace.
3. MIBK-4-Methyl-2-Pentanone.
4. Where appropriate average or the range of results from 1984 Dames and Moore analyses are indicated in square brackets.
5. Initially, ATI reported the presence of Trans-1-2, Dichloroethene, Trichloroethene, and benzene for this sample in their report No. 70306403, see Appendix B. Upon further investigation, a revised report was submitted on 16 April 1987.

TABLE 16

SUMMARY OF SEMI-VOLATILE ORGANICS
ANALYSES ON WATER SAMPLES
(EPA METHOD 625)

Well No. (Sampling Date)	Dilution Factor	Compounds Detected (concentration in ug/l)
P1 (11/4/86)	---	See Note 1
P2 (3/2/87)	2	Butylbenzylphthalate (TR)
P4 (3/2/87)	2	Butylbenzylphthalate (TR); Bis (2-Ethylhexyl); Phthalate (TR)
P3 (3/6/87)	2	None Detected
G1 (3/2/87)	2	Bis (2-Ethylhexyl); Phthalate (8)
G3 (3/2/87)	2	Bis (2-Ethylhexyl); Phthalate (25)
G2 (3/3/87)	2	Bis (2-Ethylhexyl); Phthalate (TR)
DM1 (3/6/87)	2	Phenol (86) [865]; Benzyl Alcohol (27); 2-Nitrophenol (17) [26]; Napthalene (TR) [24]; 4-Nitrophenol (TR)
DM4 (3/6/87)	2	Phenol (88); Benzyl Alcohol (26); 2-Nitrophenol (18); Napthalene (TR)
DM2 (3/9/87)	1	See Note 2. Napthalene (66)
DM3 (3/9/87)	1	See Note 2. Napthalene (6.8) [4]; Acenapthene (7.3); Benzo (K) Fluoranthene (1.3)
P5 (3/2/87)	2	None Detected
P5 (3/5/87)	2	None Detected
DM5 (3/9/87)	1	See Note 2. None Detected

Notes:

1. Sample of fluid taken from Well P1 was of the floating product and it was not analyzed for semi-volatile organics.
2. These analyses were conducted using high performance liquid chromatography in accordance with EPA Method 610.
3. Where appropriate average or the range of results from 1984 Dames and Moore analyses are indicated in square brackets.

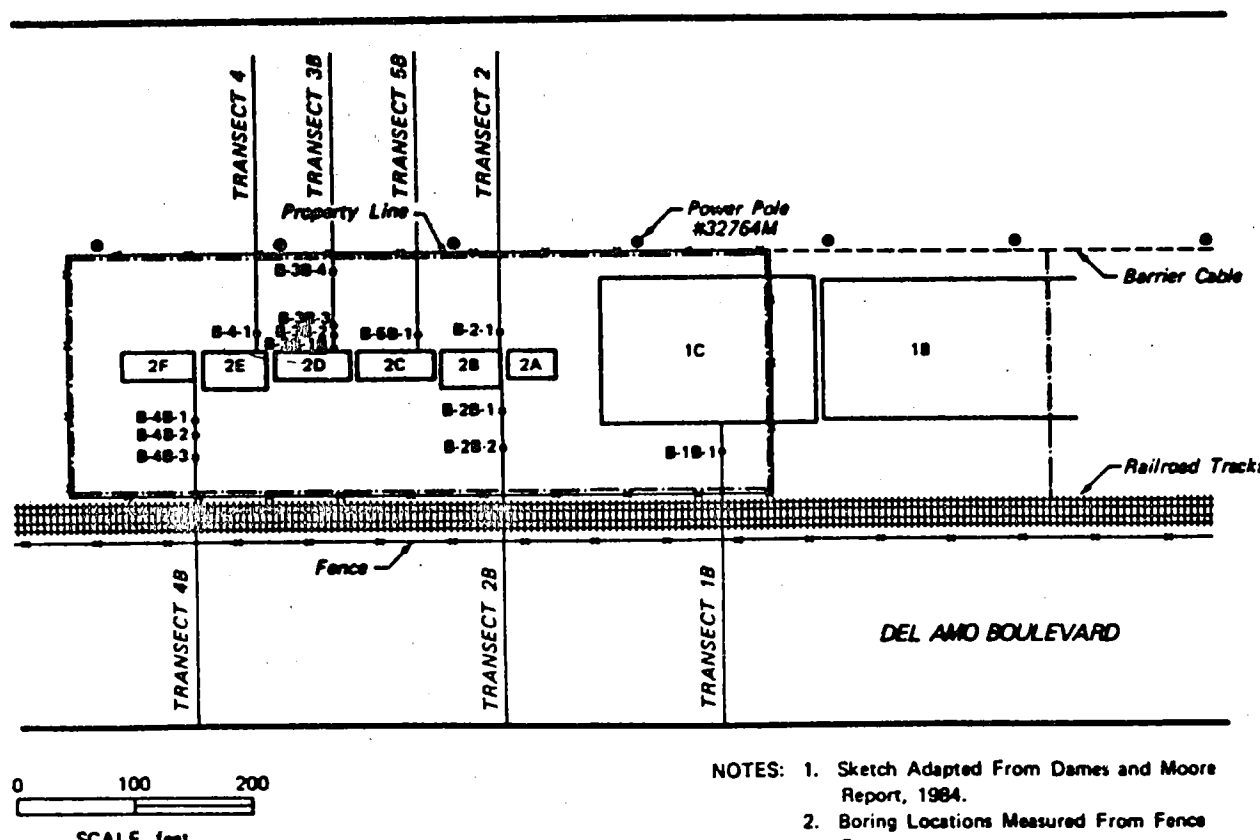
TABLE 17

SUMMARY OF LABORATORY ANALYSES ON SAMPLES OF DRILLING FLUID

Sample	Description of Compounds (Concentration in mg/kg)
Well P1A	Chloroform (5,U); Bromodichloromethane (10,5); Dibromochloromethane (15, 10).
Well G2A	Trace concentrations of Methylene Chloride, Acetone, Toluene, Ethylbenzene and Total Xylenes; di-n-octyl phthalate (0.88).

Notes:

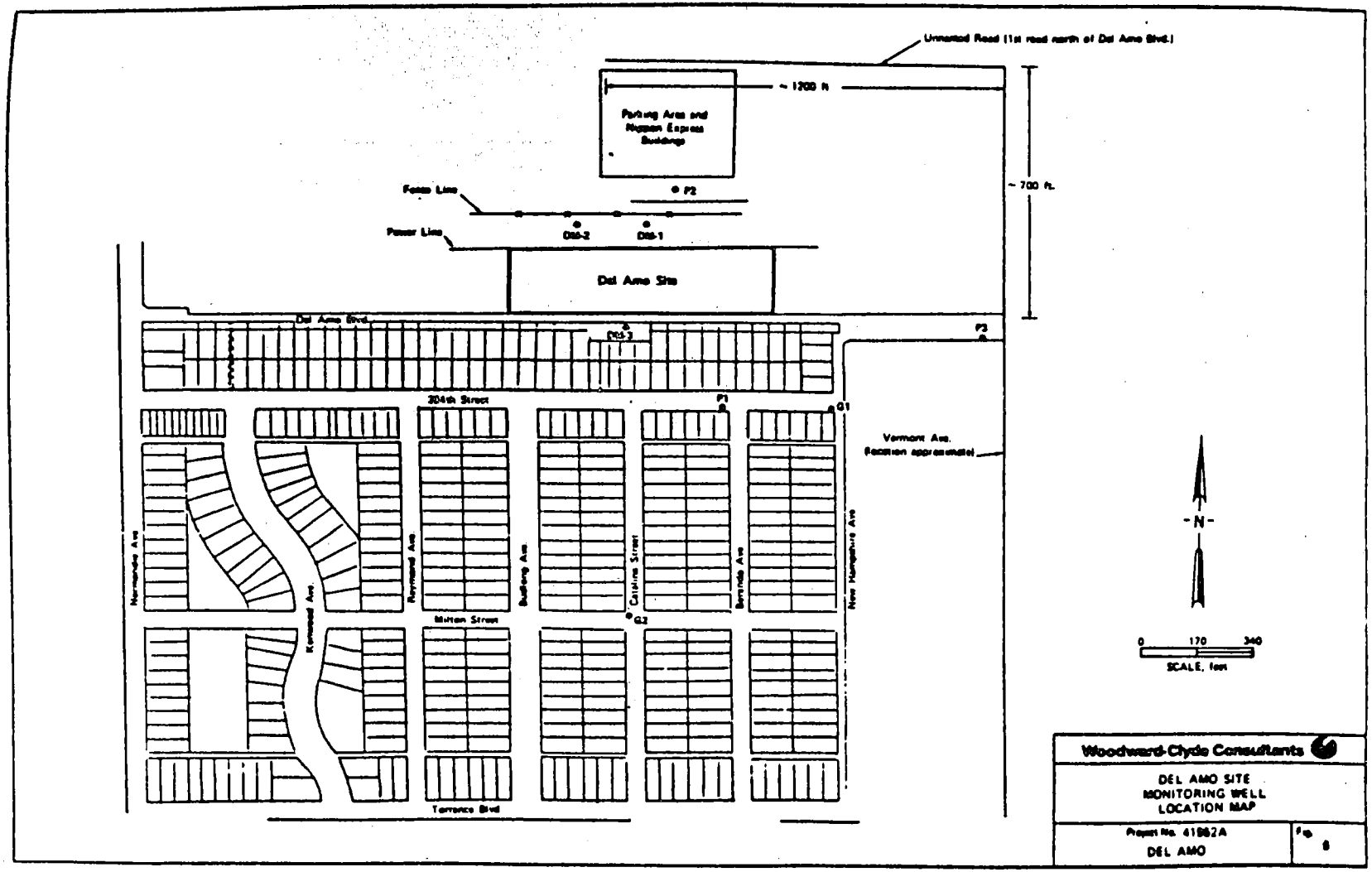
1. All compounds detected are identified.
2. At Well P1A two samples were analyzed.
3. For one sample at Well P1A, methylene chloride was also detected at 30 mg/kg and it was also found in trace concentrations in the reagent blank.
4. Miscellaneous unknown phthalate esters were also identified in the reagent blank for the Well G2A analysis.
5. U = Undetected.

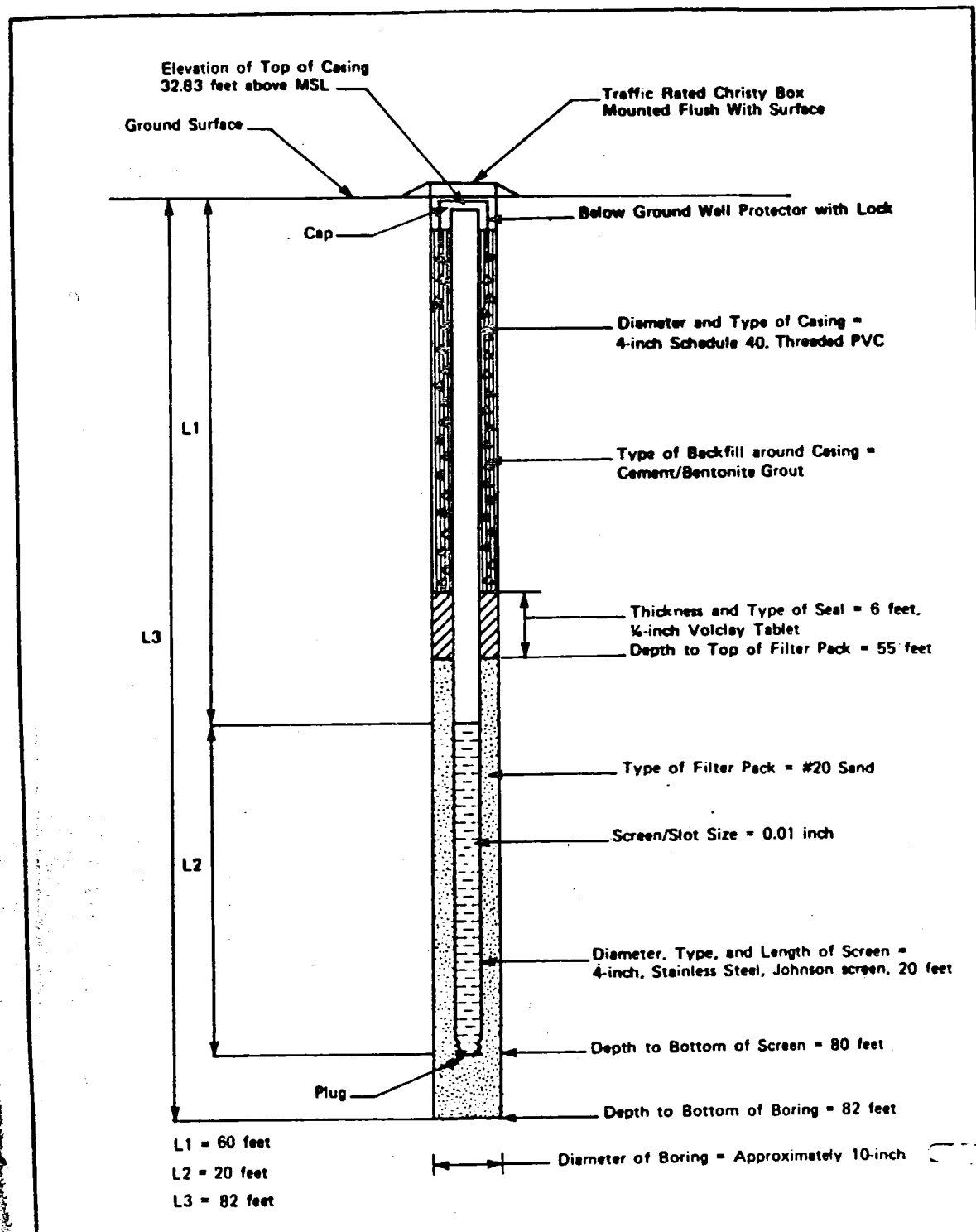


NOTES:
1. Sketch Adapted From Dames and Moore Report, 1984.
2. Boring Locations Measured From Fence Corners.
3. Designation in Shaded Areas Refer to Pit Nos.

Project: DEL AMO Project No. 41962A	APPROXIMATE LOCATION OF ON-SITE BORINGS	Fig. 2

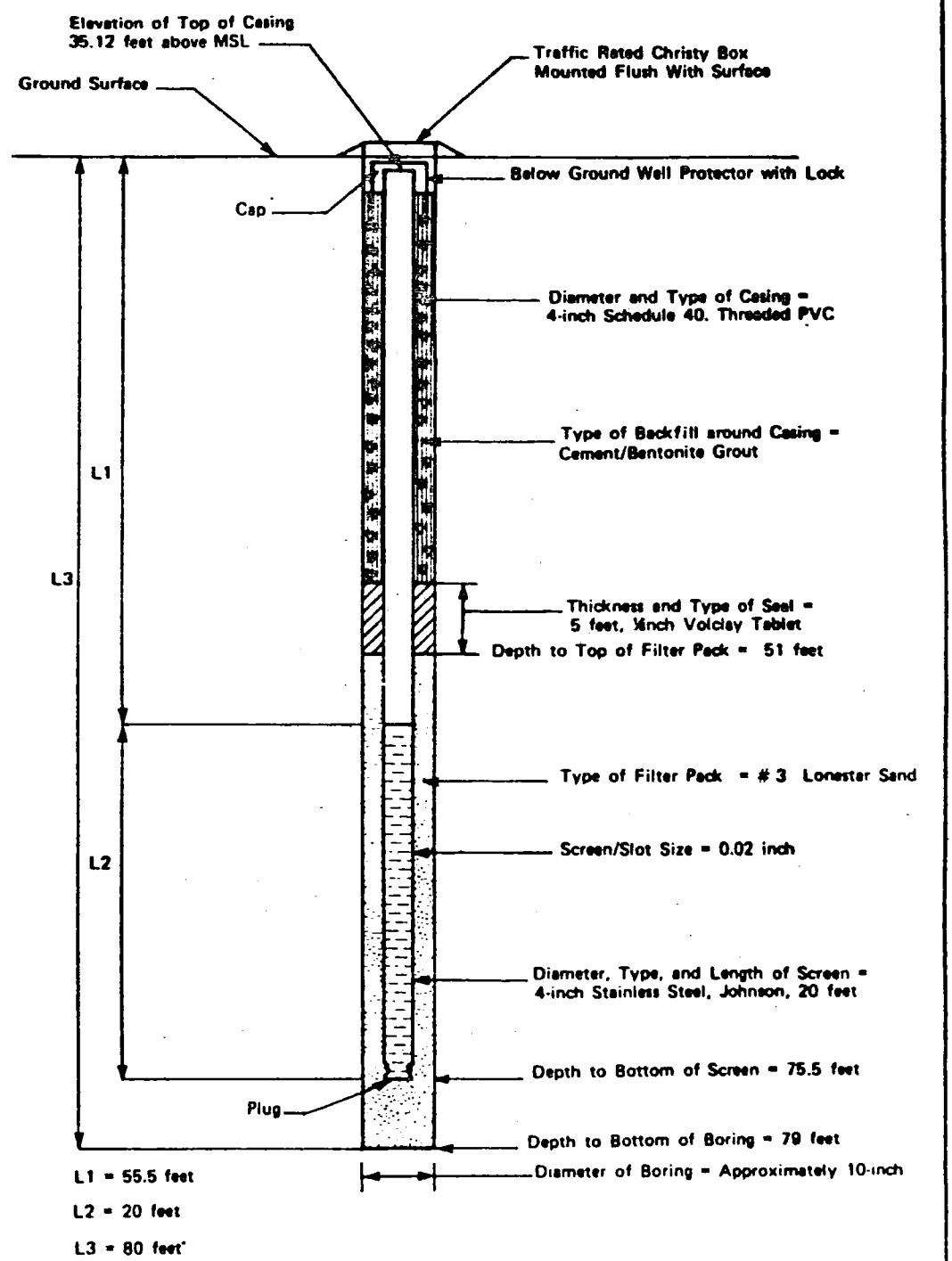
WOODWARD-CLYDE CONSULTANTS





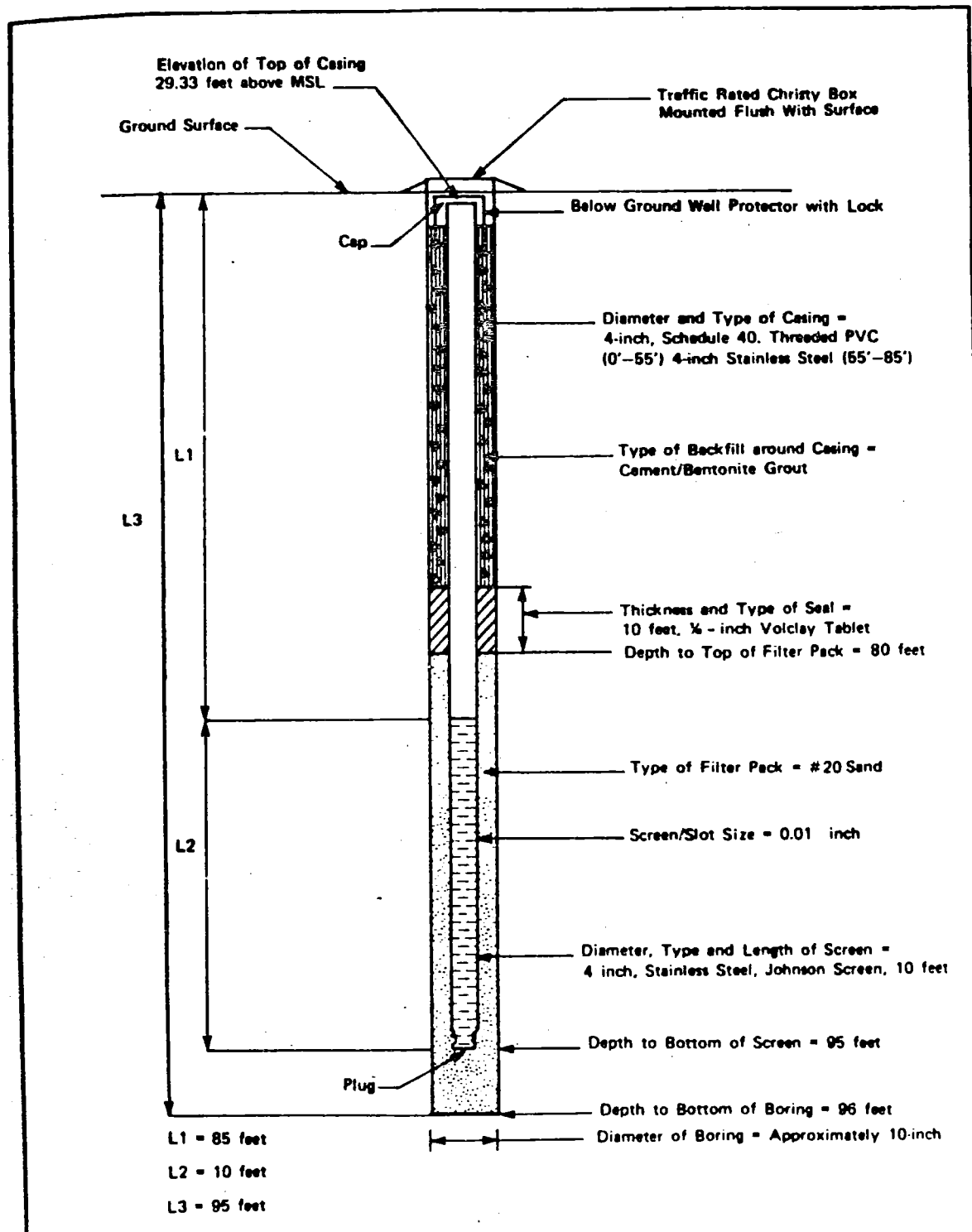
Project: DEL AMO Project No. 41962A	WELL CONSTRUCTION DETAILS WELL NO. P1	Fig. 7

WOODWARD–CLYDE CONSULTANTS



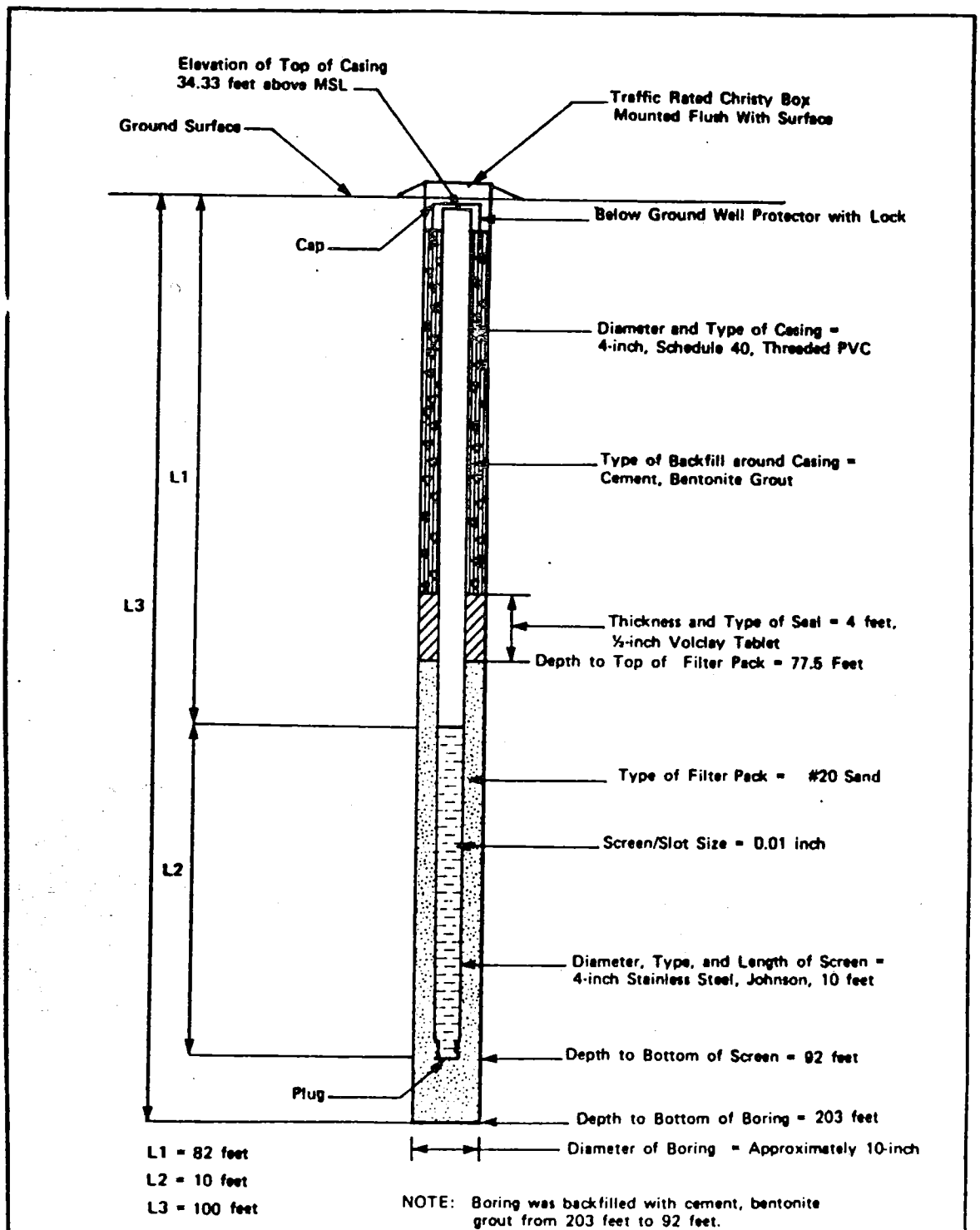
Project: DEL AMO Project No. 41962A	WELL CONSTRUCTION DETAILS WELL NO. P2	Fig. 8

WOODWARD–CLYDE CONSULTANTS



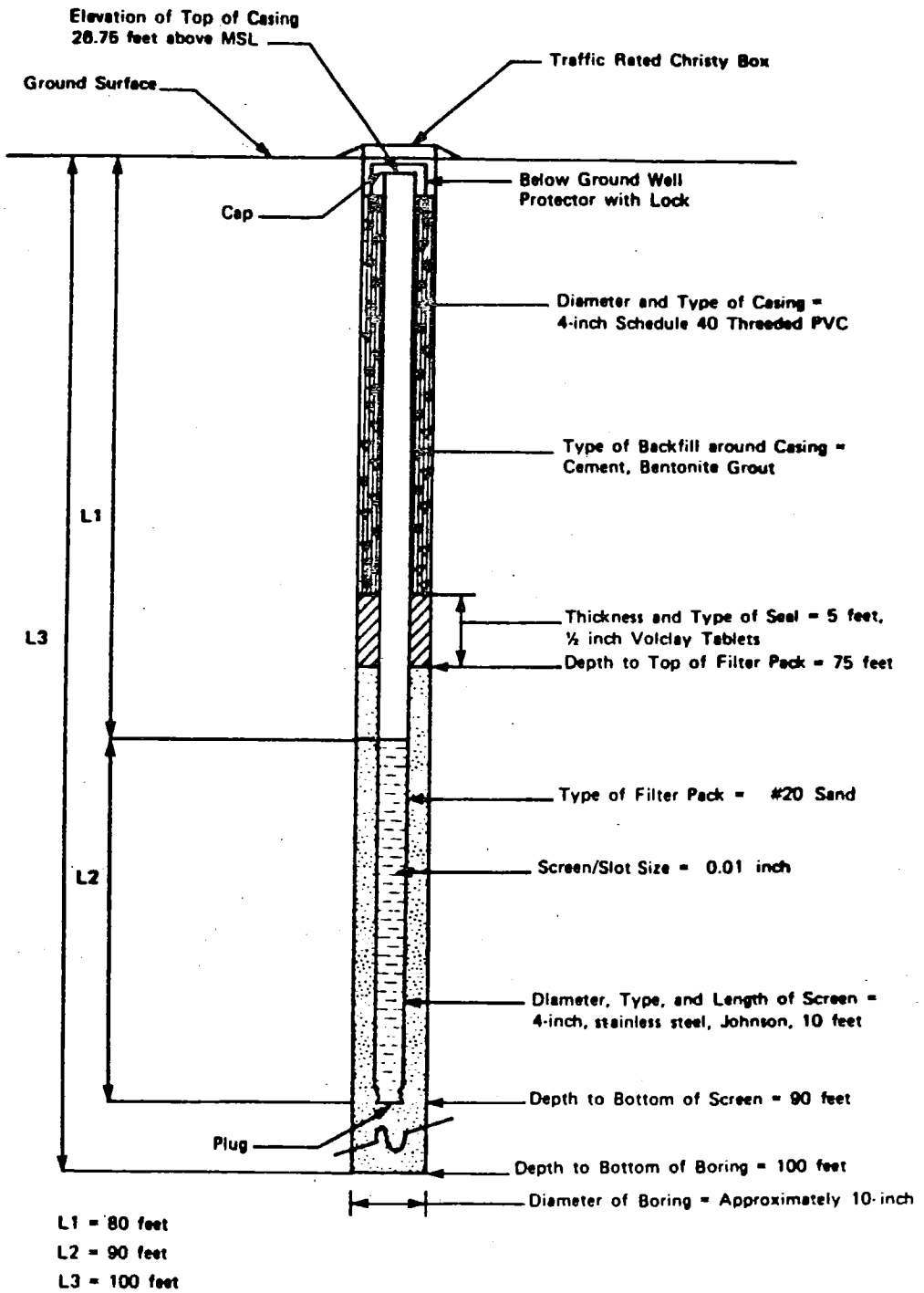
Project: DEL AMO Project No. 41962A	WELL CONSTRUCTION DETAILS WELL NO. P3	Fig. 9

WOODWARD–CLYDE CONSULTANTS



Project: DEL AMO Project No. 41962A	WELL CONSTRUCTION DETAILS WELL NO. G2	Fig. 10

WOODWARD—CLYDE CONSULTANTS



Project: DEL AMO Project No. 41962A	WELL CONSTRUCTION DETAILS WELL NO. G1	Fig. 11

WOODWARD–CLYDE CONSULTANTS

HYDROGEOLOGICAL ASSESSMENT

DEL AMO SITE
TORRANCE, CA

TDD # R9-8310-03

November 11, 1983

Submitted to: Robert M. Mandel
U.S. Environmental Protection Agency
Toxics and Waste Management Division
San Francisco, CA

ecology and environment, inc.
120 HOWARD STREET, SUITE #640, SAN FRANCISCO, CALIFORNIA 94105, TEL 415-777-2811
International Specialists in the Environmental Sciences

6.0 CONCLUSIONS/RECOMMENDATIONS

Based on available information, it does not seem likely that contamination from the site will affect the water quality of deeper potable water bearing zones. It is assumed that contaminants percolating through the unsaturated zone below the site will move slowly and eventually mix with water perched above the Bellflower aquiclude. Due to the confining properties of this aquiclude, it is unlikely that contaminants will migrate vertically beyond this zone, however, this conclusion can only be based on generalized hydrogeolic data discussed in this report. Contaminant movement in the perched aquifer will be speculative until a more site-specific subsurface investigation is conducted.

Further work should address the vertical extent of soil contamination and the vertical and areal extent of groundwater contamination within the perched aquifer overlying the Bellflower aquiclude and the Gage aquifer. Installation of monitoring wells and collection of borehole-soil samples for qualitative analyses will be necessary to identify the extent of contamination. Drilling of boreholes and wells will also aid in characterizing the percolative and permeable properties of soils controlling vertical contaminant movement through the unsaturated zone. Furthermore, the groundwater flow direction and dynamic parameters of the saturated perched zone should be determined with these newly constructed wells. This information will allow a determination of expected trends of contaminant movement.

In addition to monitoring wells, it is recommended that one well be drilled through the Bellflower aquiclude to the Gage to determine the actual nature and, thickness and permeability of the sediments that inhibit deep migration of contaminants. This well should be constructed to insure that the perforated screen within the Gage formation is isolated from the upper deposits of the perched aquifer. If on-site work indicates subsurface lateral movement of contaminated groundwater, further characterization of the perched and Gage aquifers will be necessary (i.e., sampling of existing wells, additional monitoring well installation).

MAP

Purpose: CERCLA Expanded Site Inspection

Site: Del Amo
Del Amo Blvd/Torrance Blvd
Torrance, California
Los Angeles County

Site EPA ID Number:	CAD029544731
TDD Number:	F9-8709-024
Program Account Number:	FCA0121XAA
FIT Investigators:	Timothy L. Eckard Dan Millison Jeff Muller Eric Vander Velde
Date of Inspection:	Sept. thru Dec., 1988
Report Prepared By:	Kelly Hranac Eric Vander Velde Karen Ladd
Report Date:	June 30, 1989
FIT Review/Concurrence:	
Submitted To:	Paul La Courreye Site Screening Coordinator EPA, Region IX

ecology and environment, inc.
160 SPEAR STREET SAN FRANCISCO CALIFORNIA 94105 TEL 415 777 2811
International Specialists in the Environment

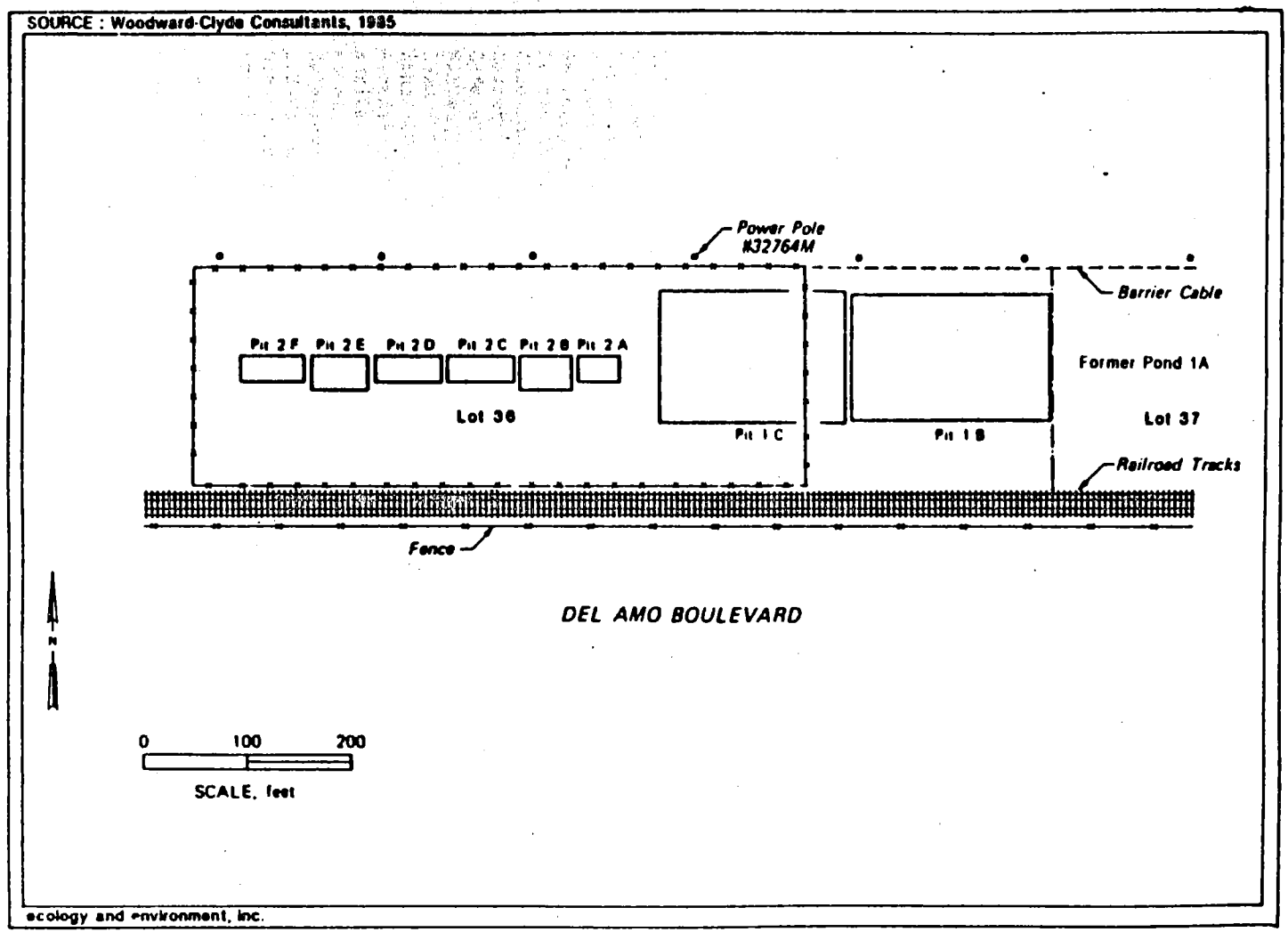


Figure 2-2 DEL AMO WASTE DISPOSAL AREAS

Table 2-3

Summary of Analytical Results for Pond 1A

Compound	Range (ppm)
Naphthalene	0-16,000
Phenanthrene	0-13,000
Fluorene	0-2,290
Pyrene	0-2,350
Acenapthylene	0-2,940
1-Ethyl-2-methylbenzene	0-130
1,1'-Biphenyl	0-250
Fluoranthene	0-966
Acenaphthene	0-1,520
2-methylnapthalene	0-590
1-methylnapthalene	0-350
Styrene	0-540
Polystrene	0-500
Anthracene	0-628
1,2-Benzanthracene	0-402
Chrysene	0-352
Indene	0-220
Methlindenes	0-810
Dimethylnaphthalene	0-250
2,3-Dihydroindene	0-110
Ethylbenezene	0-140
1,4-Diethylbenzene	0-93
Polymethylstyrene	0-97
Benzo(a)Anthracene	0-51
Triethylbenzene	0-66
Chromium	0-18
Copper	0-25
Cadmium	less than 1
Nickel	0-17
Lead	0-17
Zinc	0-106
Arsenic	0-18
Barium	0-124
Cobalt	0-18
Selenium	0-17
1,3-Diethylbenzene	M
Dihydroacenapthene	M
Phenalene	M

M = major component, but not quantified during laboratory analyses.

Note: Pond 1A has been excavated by Western Waste Industries and does not currently contain these compounds. These compounds are listed to give an indication of the types of compounds that may exist in Ponds 1B and 1C.

Source: Review of DOHS files, based upon past sampling programs undertaken by Western Waste Industries (Woodward-Clyde Consultants 1985).

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Table 2-4

Summary of Analytical Results for Pond 1B

Species Detected	Pond 1B Waste (7.5 foot depth) Concentration (ug/g)	Pond 1B Soil (45 foot depth) Concentration (ug/l)
Xylene	520	500
Benzene	153	670
C_3 substituted benzene	88	
1H-indene	740	900
1-Methyl naphthalene	570	310
2-Methyl naphthalene	590	260
Biphenyl	310	
Acenaphthene	160	50
Phenanthrene-4-methyl	79	36
Phenyl naphthalene	38	
Styrene	1400	660
Xylene*	170	
Ethylbenzene	1200	2100
Toluene	360	320
Naphthalene	890	950
Phenanthrene	340	230
Pyrene	150	95
Acenaphthene	81	50
Fluoranthene	36	30
Benzo(a)anthracene	6	
Chrysene	26	
Acenaphthylene	250	170
1-Methyl indene		140
9H-fluorene-1-methyl		15
Hexanedioic acid dioctyl ester		65
Fluorene		69

*Identity in Dames & Moore/Radian (1984) likely to be in error, probably 1-methyl indene.

SOURCE: Data from Dames & Moore/Radian 1984, reported by Woodvard-Clyde Consultants 1985.

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Table 2-5

Summary of Analytical Results for Pond 1C

Components of Pond 1C

Compound	Range (ppm)
Naphthalene	0-6,030
Ethylbenzene	0-78
Benzene	0-68
Styrene	0-230
Polystyrene	0-2,120
Polymethylstyrene	0-290
Chromium	0-590
Copper	0-75
Cadmium	0-1
Nickel	0-63
Lead	0-31
Zinc	0-30
1,4-Diethylbenzene	M
1,3-Diethylbenzene	M
Cyclohexylbenzene	M

M = major component, not quantified by laboratory analyses.

Source: Review of DOHS files, based upon past sampling by Cadillac-Fairview (Woodward-Clyde Consultants 1985).

d/kh/delamo/si

Table 2-6

Summary of Analytical Results for Sump 2E

Species Detected	Sump 2E Waste (15 foot depth) Concentration (ug/g)	Sump 2E Soil (35 foot depth) Concentration (ug/l)
Xylene	430	8500
C_4 substituted benzene*	480	3200
C_4 substituted benzene	180	5600
C_6 substituted benzene	70	950
Cyclohexylbenzene	230	4100
1,1-Ethylidene-bis-benzene*	82	2000,900
Biphenyl	41	
Naphthalene-1-phenyl	70	
Diphenylthiophene	43	
Benzene	66,000	24,000
Ethylbenzene	50,000	18,000
Toluene	940	460
Fluoranthene	68	16
Naphthalene	250	63
Phenanthrene	1000	260
Fluorene	79	34
Benzene-1,1-(methyl-1,2-ethanediyl)bis		670
Phenyl naphthalene		460
Hexanedioic acid dioctyl ester		290

* Two values for these compounds were reported.

SOURCE: Data reported in Dames & Moore/Radian 1984.

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Table 2-7

Summary of Components Found in Bog #2

Compound	Range (ppm)
Benzene	110
Methylcyclohexane	M
Tetrahydrothiophene	M
(1-Methylethyl)benzene	M
(1-Methylpropyl)benzene	M
1,4-Diethylbenzene	M
1,3-Diethylbenzene	M
1,3,5-Triethylbenzene	M
Cyclohexylbenzene	M
1,1'-Biphenyl	M
trans-1,3-Dimethylcyclopentane	M
cis-1,3-Dimethylcyclopentane	M
Ethenylbenzene	M
1,2,4-Trimethylbenzene	M
(1,1-Dimethylethyl)benzene	M

M = Major component, but not quantified during laboratory analyses.

Source: Review of DOHS files, based upon past sampling for Cadillac-Fairview (Woodward-Clyde Consultants 1985).

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Table 3-1

Monitor Well Construction Details

Monitor Well	Depth of Borehole (feet bgs*)	Well Depth (feet bgs*)	Screened Interval (feet bgs*)	Surface Elev. (mean sea level)	Casing Diameter (internal dia.)	Casing Type	Casing Interval (feet bgs*)
DA-1A	400	320	285-305	25	6"	Sch. 80 PVC	0-275
						304 Stainless Steel	275-285
						Steel 304 Stainless Screen, .02" slot	285-305
						304 Stainless Steel	305-308
DA-1B	246	229	210-220	25	4.5"	SDR-17 PVC	0-200
					4"	304 Stainless Steel	200-210
					4"	304 Stainless Steel Screen, .02" slot	210-220
					4"	304 Stainless Steel	220-223
DA-1C	81	82	81.5-82	31	2"	Sch. 40-S Stainless Steel	0-81
						BAT Probe	81-82
DA-2A	400	305	252-292	75	8"	Sch. 80 PVC	0-237
						304 Stainless Steel	237-252
						304 Stainless Steel Screen, .02 slot	252-292
						304 Stainless Steel	292-295
DA-2B	198	199	198.5-199	75	2"	Sch. 80-S Stainless Steel	0-198
						BAT Probe	198-199

*bgs = Below ground surface.

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Table 4-1

WATER LEVELS OF CLUSTER DA-1 AND DA-2 WELLS

Monitor Well	Date Measured	Depth of Measurement (feet bgs/elevation*)	Depth to Groundwater (feet bgs/elevation*)	Aquifer
DA-1	10-12-88	56.0/-31.0+	46.49 (-21.49)	Bellflower
(BAT Probe)	10-13-88	72.0/-47.0	45.75 (-20.75)	Bellflower
	10-17-88	82.0/-51.0	46.43 (-21.43)	Bellflower
	09-09-88	101.25/-76.25	48.75 (-23.75)	Bellflower/Gage
	09-28-88	318.0/-293.0	56.18 (-31.18)	Lynwood
DA-1B	10-12-88	215.0 (-190.0)°	48. (-23.)	Gage
(Monitor Well)	10-13-88	215.0 (-190.0)	48.50 (-23.50)	Gage
	10-17-88	215.0 (-190.0)	48.50 (-23.50)	Gage
DA-1A	10-12-88	295.0 (-270.0)	56.25 (-31.25)	Lynwood
(Monitor Well)	10-13-88	295.0 (-270.0)	55.50 (-30.50)	Lynwood
	10-17-88	295.0 (-270.0)	55.88 (-30.88)	Lynwood
DA-2B	11-09-88	199.0 (-124.0)	100.27 (-75.27)	Merged Surface/Gage Lynwood-Silverado
(BAT Monitor Point)				
DA-2A	11-30-88	272.0 (-197.0)	101.0 (-76.0)	Merged Surface/ Gage/Lynwood-Silverado
(Monitor Well)				

* feet below ground surface/approximate elevation above mean sea level

\+ water levels were measured at these depths with BAT probe during drilling at DA-1 cluster; except 10-17-88 measurement, which is from the permanent BAT monitoring point.

° all depth of measurements for monitor wells are from mid-point of well screen

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5. WATER QUALITY OF DEL AMO VICINITY

A total of eight monitor wells have been installed by previous investigators on the Del Amo site, all of which are screened in the unconfined aquifer. The wells are screened across either the Bellflower silt or the Bellflower/Gage sand beneath the silt. Well locations are shown on Plate 1 and well construction details for these monitor wells, as well as the two production wells sampled, are given in Table 5-1.

The first monitor wells on the site, DM-1, DM-2, DM-3, were installed by Dames & Moore/Radian Corporation and sampled in February 1984. Wells DM-1 and DM-2 were installed to the north of the waste disposal areas and DM-3 (see Plate 1). The groundwater gradient was determined by Dames & Moore to be 0.0015 foot/foot to the south-southeast. The analytical results of the Dames & Moore sampling showed that upgradient well DM-1 had very high concentrations of benzene (750,000 ppb), toluene (2600 ppb), and ethylbenzene (4000 ppb), while downgradient well DM-3 had only 9600 ppb of benzene, 52 ppb of ethylbenzene, and 7 ppb of toluene. Well DM-2, which WCC also showed to be upgradient, contained the smallest amounts of these chemicals.

Additional wells, P1, P2, P3, G1, and G2, were installed and sampled by Woodward-Clyde Consultants (WCC) for the California Department of Health Services. WCC also found the groundwater gradient to be 0.0016 to 0.0018 foot/foot to the southeast. Based on the gradient determinations, wells DM-1, DM-2, and P2 are upgradient wells of the waste disposal area and wells DM-3, P1, P3, G1 and G2 are downgradient. The results of the WCC sampling were somewhat different from those of Dames & Moore, in that they found both DM-1 and DM-2 to contain higher concentrations of benzene (380,000 ppb and 240,000 ppb respectively) than DM-3 (5,200 ppb benzene). The sample from well P1 was of floating product in the well. It contained very high concentrations of benzene (700,000 ppb), chlorobenzene (300,000 ppb), ethylbenzene (300,000), and total xylenes (140,000 ppb). Wells G1, G2, and P3 did not contain signigicant contamination.

This contaminant distribution is probably an artifact of the configuration of the old chemical plants relative to the waste disposal area; the plants were located north of the waste pits, and any leaks/spills from chemical process vessels and storage tanks would account for the present contaminant distribution.

Five boreholes were drilled at the Del Amo site by E & E FIT between September and December 1988. Monitor well cluster DA-1 is immediately downgradient of the Del Amo site, while cluster DA-2 is 2 miles to the southwest of the site. Groundwater sampling was performed during drilling activities, using the BAT groundwater sampling probe. In

d/kh/delamo/si

Table 5-1

Well Construction Details for Existing Wells

Well Name	Total Depth of Borehole (feet bgs)*	Total Depth of Well (feet bgs)*	Screened Interval (feet bgs)*	Surface Elevation (msld)+	Casing/ Screen Internal Diameter (inches)	Well Casing/ Screen Type
G1	100	90	80-90	26.75	4	Sch. 40 PVC/Stainless Steel
G-2	203	92	82-92	34.83	4	Sch. 40 PVC/Stainless Steel
P-1	82	80	60-80	32.83	4	Sch. 40 PVC/Sch. 40 PCV
P-2	79	75.5	55.5-75.5	35.12	4	Sch. 40 PVC/Sch. 40 PVC
P-3	96	95	75-85	29.33	4	0-55' Sch. 40 PVC 55-85' Stainless Steel/ Stainless Steel Screen
DM-1	100	98	68-98	~40.0	4	Sch. 40 PVC/Sch. 40 PVC
DM-2	90	90	55-90	~40.0	4	Sch. 40 PVC/Sch. 40 PVC
DM-3	90	90	55-90	~35.0	4	Sch. 40 PVC/Sch. 40 PVC
Torr. 84	812	805	240-805	~100.0	16	Steel
806C	128	128	Open end	~35.0	8	Steel

*Feet below ground surface
+Feet above mean sea level datum

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Table 5-2
Organics Results for Wells in the Del Amo Vicinity
(December 1988)

Well No. / Constituent (ug/l)	DA-1A	DA-1B	DA-1C	DA-2A	DA-2B	TOR 04	806C	G2	G1	Drinking Water Action Levels/ Standards (ug/l)
Volatiles										
Carbon Disulfide	5 U	5 U	150	5 U	39	5 U	[3] J	5 U	5 U	
1,1-Dichloroethane	5 U	5 U	5	5 U	5 U	5 U	5 U	5 U	5 U	
1,2-Dichloroethane	5 U	5 U	[4] J	5 U	5 U	5 U	5 U	5 U	5 U	
Benzene	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	0.70[a]
Toluene	[2] J	[2] J	5 U	26	[3] J	[1] J	[2] J	6	[4] J	100[a,b]
Semivolatiles										
1,2,4-Trichlorobenzene	12 U	12 U	Not Anal.	12 U	Not Anal.	11 U	12 U	12 U	[0.6] J	
Isophorone	12 U	12 U	" "	[0.8] J	" "	11 U	12 U	12 U	12 U	
2-methylnapthalene	12 U	12 U	" "	12 U	" "	11 U	12 U	12 U	12 U	
Di-n-octylphthalate	[4] J	[5] J	" "	12 U	" "	11 U	[2] J	12 U	12 U	
Di-n butylphthalate	12 U	12 U	" "	12 U	" "	11 U	12 U	12 U	12 U	
Phenol	12 U	12 U	" "	12 U	" "	11 U	12 U	12 U	12 U	
Napthalene	12 U	12 U	" "	12 U	" "	11 U	12 U	12 U	12 U	
Benzyl Alcohol	10 U	10 U	" "	10 U	" "	10 U	10 U	10 U	10 U	
2-Nitrophenol	10 U	10 U	" "	10 U	" "	10 U	10 U	10 U	10 U	
2,4-dimethyl phenol	10 U	10 U	" "	10 U	" "	10 U	10 U	10 U	10 U	
Benzoic Acid	50 U	50 U	" "	50 U	" "	50 U	50 U	50 U	50 U	
4-nitrophenol	50 U	50 U	" "	50 U	" "	50 U	50 U	50 U	50 U	
Pesticides/PCBs										
Endosulfan I	0.05 U	0.05 U	" "	0.05 U	" "	0.05 U	0.05 U	0.05 U	0.05 U	
Endrin	0.10 U	0.10 U	" "	0.10 U	" "	0.10 U	0.10 U	0.10 U	0.10 U	0.2[b]
4,4'-DDT	0.10 U	0.10 U	" "	0.10 U	" "	0.10 U	0.10 U	0.10 U	0.10 U	

Footnotes:

U = Compound was analysed for but not detected in this sample above concentration listed.
J = Results are estimates, and usable for limited purposes only.
UJ = Due to blank contamination or analytical difficulties, adjustment of the sample quantitation limit was necessary.
[ ] = A result in brackets is above the Instrument Detection Limit, but at or below the Contract Required Detection Limit.
a = Drinking water action levels recommended by the California Department of Health Services.
b = Safe Drinking Water Act Maximum Contamination Levels (MCLs).

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Table 5-2 (Continued)

Well No. Constituent (ug/l)	P1	P2	P3	DM3	DM2	DM1	DM1(DUP)	Drinking Water Action Levels/ Standards
Volatiles								
Carbon Disulfide	250 U	500 U	5 U	500 U	25000 U	25000 U	25000 U	
1,1-Dichloroethane	250 U	500 U	5 U	500 U	25000 U	25000 U	25000 U	
1,2-Dichloroethane	250 U	500 U	5 U	500 U	25000 U	25000 U	25000 U	
Benzene	520	2700UJ	5 U	7500*	150000*	380000*	390000*	0.70[a] 100[a,b]
Toluene	250U	500 U	5 U	[290]J*	[5500]*	25000 U	25000 U	
Xylenes (Total)	570	500 U	5 U	500 U	25000 U	25000 U	25000 U	
Semivolatiles								
1,2,4-Trichlorobenzene	400 U	10 U	14 U	14 U	10 U	10 U	10 U	
Isophorone	400 U	10 U	14 U	14 U	10 U	10 U	10 U	
2-methylnapthalene	3500	10 U	14 U	[6] J	10 U	10 U	10 U	
Di-n-octylphthalate	400 U	10 U	14 U	14 U	10 U	10 U	10 U	
Di-n-butylphthalate	400 U	[1] J	[2] J	14 U	15 U	17 U	15 U	
Phenol	400 U	32	14 U	56	65	87	170	
Napthalene	2200	15 U	14 U	35	[3] J	[3] J	15 U	
Benzyl Alcohol	400 U	15 U	10 U	10 U	15 U	[3] J	[1] J	
2-Nitrophenol	400 U	15 U	10 U	10 U	15 U	38	24	
2-4-dimethylphenol	400 U	15 U	10 U	10 U	[1] J	[3] J	[2] J	
Benzoic Acid	2000 U	75UJ	50 U	50 U	74UJ	[19] J	[12] J	
4-nitrophenol	2000 U	75 U	50 U	50 U	74 U	[13] J	[7] J	
Fluorene	[360] J	13.7 U	12 U	14 U	13.5 U	15.2 U	13.3 U	
Phenanthrene	710	13.7 U	12 U	14 U	13.5 U	15.2 U	13.3 U	
Pesticides/PCB								
Endosulfan I	0.70 NJ*	0.50 U	0.05 U	0.07 U	0.07 U	0.08 U		0.2[b]
Endrin	0.24 NJ	0.10 U	0.10 U	0.13 U	0.14 U	0.15 U		
4,4'DDT	0.35 NJ	0.10 U	0.10 U	0.13 J	0.14UJ	0.15UJ		

Footnotes:

U = Compound was analyzed for but not detected in this sample above concentration listed.
J = Results are estimates, and usable for limited purposes only.
UJ = Due to blank contamination or analytical difficulties, adjustment of the sample quantitation limit was necessary.
N = Compound was tentatively identified
[ ] = A result in brackets is above the Instrument Detection Limit, but at or below the Contract Required Detection Limit.
a = Drinking water action levels recommended by the California Department of Health Services.
b = Safe Drinking Water Act Maximum Contamination Levels (MCLs).
* = Concentration exceeds state or local standard.

a/kh/del/esi/tbls

Table 5-1
Metals Results for Wells in the Vicinity of the Del Amo Site
(December 1988)

Well No. / Constituent (ug/l)	DA-1A	DA-1B	DA-1C	DA-2A	DA-2B	TOR#4	806C	G2	G1	Drinking Water Action Levels/ Standards (ug/l)
Aluminum	23.4 UJ	23.4 UJ	[48.5] J	354 J	23.5 UJ	23.4 UJ	[32.3] J	[109] J	[72.8] J	
Antimony	27.4 U	27.4 U	27.4 U	27.4 U	27.4 U	27.4 U	27.4 U	27.4 U	27.4 U	
Arsenic	6.2 UJ	6.2 UJ	6.2 U	[8.5] J	6.2 UJ	6.2 UJ	6.2 U	6.2 UJ	6.2 UJ	50[a]
Barium	[21.5] J	[21.5] J	[28.9] J	[18.9] J	[21.5] J	[26.0] J	[56.5] J	[30.8] J	[45.2] J	1,000[a]
Beryllium	[0.30] J	[0.30] J	0.30 U	[0.50] J	0.30 U	0.30 U	0.30 U	0.30 U	0.30 U	
Cadmium	3.9 U	3.9 U	3.9 U	3.9 U	3.9 U	3.9 U	3.9 U	3.9 U	3.9 U	10[a]
Chromium	3.3 UJ	3.3 UJ	3.3 UJ	3.3 U	3.3 U	3.3 U	3.3 U	3.3 UJ	3.3 UJ	50[a]
Cobalt	5.8 U	5.8 U	5.8 U	5.8 U	5.8 U	5.8 U	5.8 U	5.8 U	5.8 U	
Copper	[5.8] J	[4.1] J	2.6 U	[4.8] J	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	1,000[b]
Iron	19.3 UJ	[21.8] J	[21.8] J	186 J	[28.8] J	[21.4] J	19.3 UJ	19.3 UJ	[98.3] J	300[b]
Lead	1.0 UJ	1.0 UJ	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	[2.7] J	50[a]
Manganese	1.4 U	1.4 U	488*	59.3*	38.3	25.1	427*	[4.1] J	253*	50[b]
Mercury	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	2[a]
Nickel	22.0 U	22.0 U	22.0 U	22.0 U	22.0 U	22.0 U	22.0 U	22.0 U	22.0 U	
Selenium	3.8 UJ	3.8 UJ	3.8 UJ	19.0 UJ	3.8 UJ	3.8 U	3.8 U	3.8 UJ	19.0 UJ	10[a]
Silver	4.1 U	4.1 U	4.1 U	4.1 U	4.1 U	4.1 U	4.1 U	4.1 U	4.1 U	50[a]
Thallium	5.2 U	5.2 U	5.2 U	5.2 U	5.2 U	5.2 U	5.2 U	5.2 U	5.2 U	
Vanadium	5.0 U	[6.8] J	5.0 U	[13.1] J	5.0 U	5.0 U	5.0 U	[14.9] U	5.0 U	
Zinc	20.0	[7.1] J	25.0	273	[14.8] J	[19.3] J	20.0	[9.9] J	33.3	

Footnotes:

U = Compound was analyzed for but not detected in this sample above concentration listed.
J = Results are estimates, and usable for limited purposes only.
UJ = Due to analytical problems, the sample quantitation limit is considered to be an estimate.
[ ] = A result in brackets is above the Instrument Detection Limit, but at or below the Contract Required Detection Limit.
a = EPA Primary Maximum Contaminant Level for drinking water.
b = EPA Secondary Maximum Contaminant Level for drinking water.
* = Value exceeds state or federal standard.

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Table 5-3 (Continued)

Well No. Constituent (ug/l)	P3	DM3	DM2	DM1	DM1	P2	Drinking Water Action Levels/ Standards (ug/l)
Aluminum	23.4 UJ	[60.8] J	[60.5] J	[29.1] J	[164] J	376 J	
Antimony	27.4 U	27.4 U	27.4 U	27.4 U	27.4 U	27.4 U	
Arsenic	6.2 UJ	23.1 J	6.2 U	6.2 UJ	6.2 UJ	13.5 J	50[a]
Barium	[41.5] J	[75.8] J	[104] J	[133] J	[127] J	[68.1] J	1,000[a]
Beryllium	[0.30] J	[0.30] J	0.30 U	0.30 UJ	[0.90] J	[0.40] J	
Cadmium	3.9 U	3.9 U	3.9 U	3.9 U	3.9 U	3.9 U	10[a]
Chromium	[6.4] J	3.3 UJ	3.3 UJ	3.3 U	3.3 UJ	3.3 U	50[a]
Cobalt	5.8 U	5.8 U	5.8 U	5.8 U	5.8 U	5.8 U	
Copper	2.6 U	[2.6]UJ	2.6 U	2.6 J	[3.5] J	2.6 U	1,000[b]
Iron	19.3 UJ	[3.07]J	[20.4] J	165 J	284 J	475 J*	300[b]
Lead	[2.3] J	[2.4] J	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	50[a]
Manganese	1.56	1.56 U	389*	605*	575*	2430*	50[b]
Mercury	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	2[a]
Nickel	53.5 U	22.0 U	22.0 U	22.0 U	22.0 U	22.0 U	
Selenium	3.8 UJ	3.8 UJ	19.0 UJ	3.8 UJ	3.8 UJ	3.8 U	10[a]
Silver	4.1 U	4.1 U	4.1 U	4.1 U	4.1 U	4.1 U	50[a]
Thallium	5.2 U	5.2 U	5.2 U	5.2 UJ	5.2 U	5.2 U	
Vanadium	5.0 U	5.0 UJ	5.0 U	5.0 U	5.0 U	5.0 U	
Zinc	42.5	[29.1] J	[7.8] J	82.1	146	57.7	

Footnotes:

U = Compound was analyzed for but not detected in this sample above concentration listed.
J = Results are estimates, and usable for limited purposes only.
UJ = Due to analytical problems, the sample quantitation limit is considered to be an estimate.
[ ] = A result in brackets is above the Instrument Detection Limit, but at or below the Contract Required Detection Limit.
a = EPA Primary Maximum Contaminant Level for drinking water.
b = EPA Secondary Maximum Contaminant Level for drinking water.
* = Value exceeds state or federal standard.

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6. HAZARD RANKING SYSTEM FACTORS

The following factors are used to evaluate hazardous waste sites using the U.S. EPA's Hazard Ranking System (HRS). The HRS is used to quantitatively determine the relative threat to human health and the environment posed by hazardous waste sites.

6.1 OBSERVED RELEASE

An observed release of contaminants to the aquifer of concern (Lynwood aquifer) was documented in the results of sampling at the Del Amo site, through interconnection of the Lynwood aquifer with the Gage aquifer. An observed release of napthalene, 2-methylnapthalene, and phenanthrene to the Bellflower/Gage aquifer was documented at well P1. The Bellflower/Gage is hydraulically connected to the Lynwood aquifer within 2 miles of the site. By documenting hydraulic connection between the Bellflower/Gage and the Lynwood, an observed release to the Bellflower/Gage also documents an observed release to the Lynwood.

No observed release to the air or surface water was documented.

6.2 DIRECT CONTACT

The potential for injury by direct contact with hazardous substances at the facility is not likely, as the surface impoundments containing the wastes have been covered with an engineered cap averaging 5 feet thick.

6.3 WASTE TYPE

Wastes produced from manufacturing of butadiene, styrene, and styrene butadiene rubber were deposited in two sets of on-site surface impoundments (waste bogs). Bog #1 contained three evaporation ponds (1A, 1B, 1C), while Bog #2 was comprised of six sumps (2A-2F). Wastes included heavy oil sludge from propane cracking/ethylene production and sulfur tar oil from styrene production.

Sampling of the Del Amo site Bog #1 and Bog #2 identified low levels of halogenated hydrocarbons and high levels of total volatile aromatics and total polynuclear aromatics in many of the waste samples.

6.4 WASTE QUANTITY

The waste quantity was calculated as a volume from the size of the surface impoundments. Depths of each sump ranged from approximately 8-28 feet, while the surface area ranged from approximately 1,025-22,040 $feet^2$. Based on the analytical results of the soil samples collected during boring, Dames & Moore estimated the waste quantity in Bogs #1 and #2 to be approximately 16,000 cubic yards (1984).

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6.5 GROUNDWATER

The aquifer of concern is the Lynwood, which is used as a local drinking water source. An observed release of contaminants to the Gage aquifer was documented during this investigation. Because the Gage and Lynwood aquifers were shown to be interconnected within 2 miles of the Del Amo site, this observed release to the Gage is also considered an observed release to the Lynwood aquifer.

At the DA-1 well cluster site, core samples from the pilot boreholes confirmed that the Bellflover and Gage are one continuous vertical unit. Depth to groundwater in the Bellflover/Gage aquifer ranges from 47 to 57 feet below ground surface (bgs). The average saturated thickness of this aquifer is 170 feet. No extensive clay layers were encountered during drilling activities. Clay layers observed during drilling were typically 2 to 4 feet thick, and contained silt and sand clasts. These sand clasts and interbeds, coupled with stratigraphic similarity to nearby sites of known contamination in the Gage (Metcalf & Eddy, 1986, 1987), document the fact that these thin clay units do not make up an effective aquitard between the Bellflover and Gage units. Approximately 42 feet of clay and silt separate the Gage and Lynwood aquifers at this location.

The DA-2 well cluster site was chosen to document interconnection between the aquifers within a 2-mile radius of the Del Amo site. Continuous coring of thhe borehole at this site confirmed the merging of the Bellflover/Gage aquifer with the Lynwood aquifer, into a single vertically continuous unit, since sands were encountered from near ground surface to a depth of 400 feet. The depth to groundwater ranges from 95 to 101 feet bgs.

The Lynwood aquifer is used to supply drinking water in the Torrance area, although these drinking water wells are usually perforated in other aquifers as well. The City of Torrance operates two municipal wells, Torrance #4 (4S/14W-10k02) and Torrance #5 (4S/14W-10k03), within 0.5 miles of the DA-2 site. Both of these wells are screened in the Lynwood and Silverado aquifers. The Torrance wells are generally pumped only from May until October each year and provide 12% of the total water supply of Torrance (personal communication, C. Schiach, City of Torrance, 5/19/89). The water from these wells serves between 25,000 and 30,000 people.

6.6 SURFACE WATER

The nearest surface water body to the site is the Los Angeles Flood Control District's (LAFCD) Torrance Lateral which is approximately 0.25 miles southeast of the site. The Torrance Lateral flows east approximately 0.75 miles where it joins the LAFCD Dominguez Channel. The channels are not used for drinking water or irrigation purposes; they are not used for recreational purposes, and there are no sensitive environments along the pathway.

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